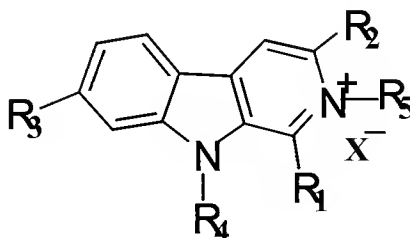


The listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently amended) A compound of the following formula (I)



wherein

R₁ is selected from the group consisting of hydrogen, and linear or branched C₁₋₆ alkyl, ~~C₆₋₁₀ arylalkyl, mono- or multi-substituted C₆₋₁₀ arylalkyl, heterocyclic group and alkenyl, wherein the substituents are defined to be halogen, C₁₋₄ linear or branched alkyl, C₁₋₄ linear or branched alkoxy, nitro, amino, hydroxyl and carboxyl;~~

R₂ is selected from the group consisting of ~~hydrogen,~~ carboxyl, ester group, carboxylate, acylamino and, ~~acyl halide group,~~ linear or branched C₁₋₆ alkoxy carbonyl, ~~C₆₋₁₀ arylalkoxy carbonyl, mono- or multi- C₆₋₁₀ arylalkoxy carbonyl, and or heterocyclic oxy carbonyl, wherein the substituents are defined as above;~~

R₃ is selected from the group consisting of hydrogen, hydroxyl, linear or branched C₁₋₆ alkoxy, and carboxylic esters, ~~carboxylic salts, C₆₋₁₀ arylalkoxy, and heterocyclic oxy group;~~

R₄ is selected from the group consisting of ~~hydrogen, linear or branched C₁₋₆ alkyl, hydroxyl- linear or branched C₁₋₆ alkyl, C₆₋₁₀ arylalkyl, mono- or multi-substituted C₆₋₁₀ arylalkyl, and heterocyclic group,~~ wherein the substituents are defined ~~as above;~~ to be halogen, C₁₋₄ linear or branched alkyl, C₁₋₄ linear or branched alkoxy, nitro, amino, hydroxyl and carboxyl;

R₅ is selected from the group consisting of hydrogen, ~~C₁₋₆ linear or branched alkyl, C₆₋₁₀ arylalkyl, mono- or multi-substituted C₆₋₁₀ arylalkyl,~~ wherein the substituents are defined as above;

X is selected from the group consisting of pharmacologically acceptable organic or inorganic acid radical, wherein the organic acids include Lewis acid,

or R₅ and X do not co-exist; and

~~R₁, R₂, R₃, R₄ and R₅ do not represent hydrogen at the same time, and~~

~~when R₂, R₄ and R₅ are hydrogen, R₁ does not represent methyl and R₃ does not represent methoxy;~~

~~when R₁ is methyl, R₂, R₃, R₄ and R₅ do not represent hydrogen at the same time;~~

~~when R₁ is methyl, R₂ and R₅ are hydrogen, and R₃ is methoxy, R₄ is not methyl, ethyl or butyl;~~

~~when R₁, R₃, R₄ and R₅ are hydrogen, R₂ is not C₁₋₄ linear or branched alkoxy carbonyl;~~

~~when R₁ is methyl, R₂ is hydrogen, and R₃ is linear or branched alkoxy, R₄ and R₅ do not represent hydrogen at the same time;~~

~~when R₁, R₃ and R₄ are hydrogen, R₂ is ethoxycarbonyl and X is trifluoromethylsilyl, R₅ is not *n*-propyl, allyl, or ortho-, meta-, or *p*-fluorobenzyl; and at the same time~~

the following compound is ~~compounds are~~ excluded:

~~Ethyl 1-methyl- β -carboline-3-carboxylate,~~

~~Methyl 1-phenyl- β -carboline-3-carboxylate,~~

~~Methyl 1-(4-methoxy)phenyl- β -carboline-3-carboxylate,~~

~~β -Carboline-3-carboxylic acid,~~

~~3-Hydroxymethyl- β -carboline,~~

~~3-Amino- β -carboline,~~

~~3-[(Methoxycarbonyl)amino]- β -carboline,~~

~~3-[(Ethoxycarbonyl)amino]- β -carboline,~~

~~Ethyl 9-methyl- β -carboline-3-carboxylate,~~

~~Ethyl 1,9-dimethyl- β -carboline-3-carboxylate,~~

Ethyl 9-benzyl-1-methyl- β -carboline-3-carboxylate, ~~and~~.

~~9-Methyl- β -carboline.~~

2. (Canceled)

3. (Currently amended) The compound according to claim ~~2~~1, characterized in that R₁ is selected from the group consisting of hydrogen, C₁₋₄ linear or branched alkyl, ~~C₆₋₁₀-aryl-C₀₋₄ linear or branched alkyl, mono- or multi-substituted C₆₋₁₀-aryl-C₀₋₄ linear or branched alkyl.~~

4. (Currently amended) The compound according to claim 3, characterized in that R₁ is selected from the group consisting of hydrogen, C₁₋₂ alkyl, phenyl-C₀₋₄ linear or branched alkyl, ~~mono- or multi-substituted phenyl-C₀₋₄ linear or branched alkyl.~~

5. (Currently amended) The compound according to claim 4, characterized in that R₁ is selected from hydrogen, methyl, ~~phenyl, and mono- or multi-substituted phenyl.~~

6. (Canceled)

7. (Original) The compound according to claim 5, characterized in that R₁ is hydrogen.

8. (Original) The compound according to claim 5, characterized in that R₁ is methyl.

9. (Currently amended) The compound according to claim 1, characterized in that R₂ is selected from the group consisting of ~~hydrogen~~, carboxylic acid, carboxylic metal salts, C₁₋₆ linear or branched alkoxycarbonyl, ~~C₆₋₁₀-aryl-C₁₋₆ linear or branched alkoxycarbonyl, mono- or multi-C₆₋₁₀-aryl-C₁₋₆ linear or branched alkoxycarbonyl,~~ and when R₂ is a carboxylic metal salt, R₅ and X are not present simultaneously.

10. (Currently amended) The compound according to claim 9, characterized in that R₂ is selected from the group consisting of hydrogen, carboxylic acid, carboxylic metal salts, C₁₋₄ linear or branched alkoxycarbonyl, ~~phenyl-C₁₋₄ alkoxycarbonyl, mono- or multi-phenyl-C₁₋₄ alkoxycarbonyl,~~ and when R₂ is a carboxylic metal salt, R₅ and X are not present simultaneously.

11. (Currently amended) The compound according to claim 10, characterized in that R₂ is selected from the group consisting of hydrogen, carboxylic acid, carboxylic alkali metal salts, C₁₋₂ alkoxycarbonyl, ~~benzyloxycarbonyl, wherein the alkali metals refer to lithium, sodium, potassium, rubidium and cesium.~~

12. (Canceled)

13. (Canceled)

14. (Original) The compound according to claim 12, characterized in that R_2 is carboxylic acid.

15. (Canceled)

16. (Original) The compound according to claim 12, characterized in that R_2 is ethoxycarbonyl.

17. (Currently amended) The compound according to claim 1, characterized in that R_3 is selected from the group consisting of hydrogen, hydroxyl, C_{1-6} linear or branched alkoxy, ~~C_{6-10} aryl- C_{1-6} linear or branched alkoxy, and heterocyclic oxy group.~~

18. (Original) The compound according to claim 17, characterized in that R_3 is selected from the group of hydrogen, hydroxyl, and C_{1-4} linear or branched alkoxy.

19. (Original) The compound according to claim 18, characterized in that R_3 is selected from the group consisting of hydrogen and C_{1-2} alkoxy.

20. (Original) The compound according to claim 19, characterized in that R_3 is hydrogen.

21. (Currently amended) The compound according to claim 1, characterized in that R_4 is selected from the group consisting of ~~hydrogen, C_{1-6} linear or branched alkyl, hydroxyl- C_{1-6} linear or branched alkyl,~~ C_{6-10} aryl- C_{1-6} linear or branched alkyl, and mono- or multi-substituted C_{6-10} aryl- C_{1-6} linear or branched alkyl.

22. (Currently amended) The compound according to claim 21, characterized in that R_4 is selected from the group consisting of ~~hydrogen, C_{1-4} linear or branched alkyl, hydroxyl- C_{1-4} linear or branched alkyl,~~ C_{6-10} aryl- C_{1-4} linear or branched alkyl, and mono- or multi-substituted C_{6-10} aryl- C_{1-4} linear or branched alkyl.

23. (Currently amended) The compound according to claim 22, characterized in that R_4 is selected from the group consisting of ~~hydrogen, C_{1-4} linear or branched alkyl, hydroxyl- C_{1-2} alkyl,~~ phenyl- C_{1-4} linear or branched alkyl, and mono- or multi-substituted phenyl-(C_{1-4}) linear or branched alkyl.

24. (Original) The compound according to claim 23, characterized in that R₄ is selected from the group consisting of hydrogen, C₁₋₄ linear or branched alkyl, phenyl-C₁₋₂ alkyl, and mono- or multi-substituted phenyl-C₁₋₂ alkyl.

25. (Canceled)

26. (Canceled)

27. (Original) The compound according to claim 25, characterized in that R₄ is benzyl.

28. (Original) The compound according to claim 25, characterized in that R₄ is pentafluorobenzyl.

29. (Canceled)

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Canceled)

34. (Canceled)

35. (Canceled)

36. (Canceled)

37. (Original) The compound according to claim 1, characterized in that X is selected from the group consisting of halogen, nitroxyl, sulfuric acid group, sulfonic acid group, and phosphate group; or X is not present.

38. (Original) The compound according to claim 37, characterized in that X is halogen; or X is not present.

39. (Canceled)

40. (Original) The compound according to claim 38, characterized in that X is chloro.

41. (Original) The compound according to claim 38, characterized in that X is bromine.

42. (Original) The compound according to claim 38, characterized in that X is iodine.

43. (Currently amended) The compound according to claim 1, characterized in that R₁ is selected from the group consisting of hydrogen, C₁₋₆ linear or branched alkyl, ~~C₆₋₁₀-aryl-C₀₋₆ linear or branched alkyl, mono- or multi-substituted C₆₋₁₀-aryl-C₀₋₆ linear or branched alkyl~~; R₂ is selected from the group consisting of ~~hydrogen~~, carboxylic acid group, carboxylates, C₁₋₆ linear or branched alkoxycarbonyl, ~~C₆₋₁₀-aryl-C₁₋₆ linear or branched alkoxycarbonyl, mono- or multi-C₆₋₁₀-aryl-C₁₋₆ linear or branched alkoxycarbonyl~~; R₃ is selected from the group consisting of hydrogen, hydroxyl, C₁₋₆ linear or branched alkoxy, ~~C₆₋₁₀-aryl-C₁₋₆ linear or branched alkoxy~~; R₄ is selected from the group consisting of ~~hydrogen, C₁₋₆ linear or branched alkyl, hydroxyl-C₁₋₆ linear or branched alkyl~~, C₆₋₁₀ aryl-C₁₋₆ linear or branched alkyl, and mono- or multi-substituted C₆₋₁₀ aryl-C₁₋₆ linear or branched alkyl; R₅ is selected from the group consisting of hydrogen, ~~C₁₋₆ linear or branched alkyl, C₆₋₁₀-aryl-C₁₋₆ linear or branched alkyl, mono- or multi-substituted C₆₋₁₀-aryl-C₁₋₆ linear or branched alkyl~~; X is selected from the group consisting of halogen, sulfonic acid group, sulfuric acid group, nitroxyl, and phosphate group; or R₅ and X do not co-exist simultaneously.

44. (Currently amended) The compound according to claim 43, characterized in that R₁ is selected from the group consisting of hydrogen, C₁₋₄ linear or branched alkyl, ~~C₆₋₁₀-aryl-C₀₋₄ linear or branched alkyl, mono- or multi-substituted C₆₋₁₀-aryl-C₀₋₄ linear or branched alkyl~~; R₂ is selected from the group consisting of hydrogen, carboxylic acid group, carboxylic alkali metal salts, C₁₋₄ linear or branched alkoxycarbonyl, ~~C₆₋₁₀-aryl-C₁₋₄ linear or branched alkoxycarbonyl, mono- or multi-C₆₋₁₀-aryl-C₁₋₄ linear or branched alkoxycarbonyl~~; R₃ is selected from the group consisting of hydrogen, hydroxyl, C₁₋₄ linear or branched alkoxy; R₄ is selected from the group consisting of ~~hydrogen, C₁₋₄ linear or branched alkyl, hydroxyl-C₁₋₄ linear or branched alkyl~~, C₆₋₁₀ aryl-C₁₋₄ linear or branched alkyl, and mono- or multi-substituted C₆₋₁₀ aryl-C₁₋₄ linear or branched alkyl; R₅ is selected from the group consisting of hydrogen, ~~C₁₋₄ linear or branched alkyl, C₆₋₁₀-aryl-C₁₋₄ linear or branched alkyl, mono- or multi-substituted C₆₋₁₀-aryl-C₁₋₄ linear or branched alkyl~~; X is selected from the group consisting of halogen, sulfuric acid group, sulfonic acid group, nitroxyl; or R₅ and X do not co-exist simultaneously.

45. (Currently amended) The compound according to claim 44, characterized in that R₁ is selected from the group consisting of hydrogen, C₁₋₂ alkyl, ~~phenyl-C₀₋₂-alkyl, mono- or multi-substituted phenyl-C₀₋₂-alkyl~~; R₂ is selected from the group consisting of hydrogen, carboxylic acid group, carboxylic alkali metal salts, C₁₋₂ alkoxycarbonyl; R₃ is selected from the group consisting of hydrogen, hydroxyl, and C₁₋₂ alkoxy; R₄ is selected from the group consisting of ~~hydrogen, C₁₋₄ linear or branched alkyl~~, phenyl-C₁₋₂ alkyl, and mono- or multi-substituted

phenyl-C₁₋₂ alkyl; R₅ is selected from the group consisting of hydrogen, ~~C₃₋₄ linear or branched alkyl, phenyl-C₁₋₂ alkyl, mono or multi-substituted phenyl-C₁₋₂ alkyl~~; X is halogen; or R₅ and X do not co-exist simultaneously.

46. (Currently amended) The compound according to claim 45, characterized in that R₁ is selected from the group consisting of hydrogen, methyl, ~~phenyl, mono or multi-substituted phenyl~~; R₂ is selected from the group consisting of ~~hydrogen~~, carboxylic acid group, sodium or potassium carboxylate, and ethoxycarbonyl; R₃ is selected from the group consisting of hydrogen, hydroxyl, and C₁₋₂ alkoxy; R₄ is selected from the group consisting of ~~hydrogen, ethyl, butyl~~, benzyl, and pentafluorobenzyl; R₅ is selected from the group consisting of ~~hydrogen, linear or branched butyl, benzyl, and pentafluorobenzyl~~; X is selected from the group consisting of chloro, bromine and iodine; or R₅ and X do not co-exist simultaneously.

47. (Currently amended) The compound according to claim 46, wherein R₁ is hydrogen or methyl; R₂ is carboxylic acid group, sodium carboxylate, or ethoxycarbonyl; R₃ is hydrogen; R₄ is ~~butyl or~~ benzyl; R₅ is hydrogen ~~or benzyl~~; X is chloro or bromine; or R₅ and X do not co-exist simultaneously.

48. (Original) The compound according to claim 1, wherein R₁ is hydrogen; R₂ is ethoxycarbonyl; R₃ is hydrogen; R₄ is benzyl; R₅ is hydrogen; and X is chloro.

49. (Original) The compound according to claim 1, wherein R₁ is hydrogen; R₂ is ethoxycarbonyl; R₃ is hydrogen; R₄ is benzyl; R₅ and X do not co-exist simultaneously.

50. (Original) The compound according to claim 1, wherein R₁ is methyl; R₂ is ethoxycarbonyl; R₃ is hydrogen; R₄ is pentafluorobenzyl; R₅ is hydrogen, and X is chloro.

51. (Original) The compound according to claim 1, wherein R₁ is methyl; R₂ is ethoxycarbonyl; R₃ is hydrogen; R₄ is pentafluorobenzyl; and X do not co-exist simultaneously.

52. (Canceled)

53. (Canceled)

54. (Canceled)

55. (Canceled)

56. (Canceled)

57. (Canceled)

58. (Canceled)

59. (Canceled)

60. (Canceled)

61. (Currently amended) The compound according to claim 1, which is selected from the group consisting of the following compounds or pharmacologically acceptable salts thereof:

~~9-Hydroxyethyl-7-methoxy- β -carboline;~~

~~9-Benzyl-7-methoxy- β -carboline;~~

~~9-(2',3',4',5',6'-Pentafluoro)benzyl-7-methoxy- β -carboline;~~

~~9-Phenylpropyl-7-methoxy- β -carboline;~~

~~Ethyl 1-ethyl- β -carboline-3-carboxylate;~~

~~Ethyl 1-n-propyl- β -carboline-3-carboxylate;~~

~~Methyl 1-(4-hydroxyphenyl)- β -carboline-3-carboxylate;~~

~~3-Acetyloxomethyl- β -carboline;~~

~~Methyl 9-methyl- β -carboline-3-carboxylate;~~

~~Methyl 9-ethyl- β -carboline-3-carboxylate;~~

~~Methyl 9-butyl- β -carboline-3-carboxylate;~~

~~Methyl 9-benzyl- β -carboline-3-carboxylate;~~

~~Ethyl 9-ethyl- β -carboline-3-carboxylate;~~

~~Ethyl 9-butyl- β -carboline-3-carboxylate;~~

Ethyl 9-benzyl- β -carboline-3-carboxylate;
 Ethyl 9-(2',3',4',5',6'-pentafluoro)benzyl- β -carboline-3-carboxylate;
 Butyl 9-phenylpropyl- β -carboline-3-carboxylate;
~~Butyl 9-acetophenone- β -carboline-3-carboxylate;~~
~~Butyl 9-methyl- β -carboline-3-carboxylate;~~
~~Butyl 9-ethyl- β -carboline-3-carboxylate;~~
 Butyl 9-benzyl- β -carboline-3-carboxylate;
 Benzyl 9-benzyl- β -carboline-3-carboxylate;
 9-Benzyl-3-hydroxymethyl- β -carboline;
 9-Benzyl-3-acetyloxomethyl- β -carboline;
~~3-Carbohydrazide-9-ethyl- β -carboline;~~
 3-Carbohydrazide-9-benzyl- β -carboline;
~~3-[(Methoxycarbonyl)amino]-9-ethyl- β -carboline;~~
~~3-[(Ethoxycarbonyl)amino]-9-ethyl- β -carboline;~~
 3-[(Ethoxycarbonyl)amino]-9-benzyl- β -carboline;
~~Ethyl 9-ethyl-1-methyl- β -carboline-3-carboxylate;~~
~~Ethyl 9-butyl-1-methyl- β -carboline-3-carboxylate;~~
 Ethyl 9-(2',3',4',5',6'-pentafluoro)benzyl-1-methyl- β -carboline-3-carboxylate;
 Ethyl 9-phenylpropyl-1-methyl- β -carboline-3-carboxylate;
 Ethyl 9-acetophenone-1-methyl- β -carboline-3-carboxylate;

~~Ethyl 1-propyl-9-methyl- β -carboline-3-carboxylate;~~

~~Ethyl 1-propyl-9-ethyl- β -carboline-3-carboxylate;~~

Ethyl 9-benzyl-1-propyl- β -carboline-3-carboxylate;

Ethyl 9-phenylpropyl-1-propyl- β -carboline-3-carboxylate;

~~Methyl 1-phenyl-9-methyl- β -carboline-3-carboxylate and~~

~~Methyl 1-phenyl-9-ethyl- β -carboline-3-carboxylate.~~

62. (Original) The compound according to claim 61, the pharmacologically acceptable salt thereof being hydrochloride salt.

63. (Currently amended) The compound according to claim 1, which is selected from the group consisting of the following compounds or pharmacologically acceptable carboxylates thereof:

~~9-Methyl- β -carboline-3-carboxylic acid;~~

~~9-Ethyl- β -carboline-3-carboxylic acid;~~

~~9-Butyl- β -carboline-3-carboxylic acid;~~

9-Benzyl- β -carboline-3-carboxylic acid;

9-(2',3',4',5',6'-Pentafluoro)benzyl- β -carboline-3-carboxylic acid;

9-Phenylpropyl - β -carboline-3-carboxylic acid;

~~9-Acetophenone- β -carboline-3-carboxylic acid;~~

~~9-Methyl-1-methyl- β -carboline-3-carboxylic acid;~~

~~9-Ethyl-1-methyl- β -carboline-3-carboxylic acid;~~

~~9-Butyl-1-methyl- β -carboline-3-carboxylic acid;~~

9-Benzyl-1-methyl- β -carboline-3-carboxylic acid;

9-(2',3',4',5',6'-Pentafluoro)benzyl-1-methyl- β -carboline-3- carboxylic acid;

9-Phenylpropyl-1-methyl- β -carboline-3-carboxylic acid;

~~9-Acetophenone-1-methyl- β -carboline-3-carboxylic acid;~~

~~1-Propyl-9-methyl- β -carboline-3-carboxylic acid;~~

~~1-Propyl-9-ethyl- β -carboline-3-carboxylic acid;~~

9-Benzyl-1-propyl- β -carboline-3-carboxylic acid;

9-Phenylpropyl-1-propyl- β -carboline-3-carboxylic acid;

~~1-Phenyl-9-methyl- β -carboline-3-carboxylic acid and~~

~~1-Phenyl-9-ethyl- β -carboline-3-carboxylic acid.~~

64. (Original) The compound according to claim 63, wherein the carboxylate is a carboxylic metal salt.

65. (Canceled)

66. (Canceled)

67. (Currently amended) The compound according to claim 64 ~~65~~, wherein the ~~alkali~~ metal is Na.

68. (Currently amended) The compound according to claim 64 ~~65~~, wherein the ~~alkali~~ metal is K.

69. (Canceled)

70. (Canceled)

71. (Canceled)

72. (Canceled)

73. (Canceled)

74. (Canceled)

75. (Canceled)

76. (Previously presented) A pharmaceutical composition for treating tumors, comprising as an active ingredient at least one therapeutically effective amount of a compound of formula I according to claim 1, alone or combined with one or more pharmaceutically acceptable, inert and non-toxic excipients or carriers.

77. (Previously presented) Use of a compound of claim 1 in the manufacture of a medicament for treating tumors.

78. (Original) The use according to claim 77, wherein the tumors refer to alimentary tract tumors, including oral carcinoma, oesophagus cancer, gastric carcinoma, liver cancer and intestinal cancer tumors.

79. (Original) The use according to claim 77, wherein the tumors refer to the lung cancer tumors.

80. (Canceled)

81. (Canceled)

82. (Canceled)

83. (Original) The use according to claim 77, wherein the tumors refer to the cervical carcinoma tumors.

84. (Previously presented) The use of a compound of claim 1 in the manufacture of a medicament combined with phototherapy and radiation therapy for treating tumors.